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A Description of the Exhibit

A POUND OF PORK EVERY SEVEN MINUTES

Shown by the

UNITED STATES DEPARTMENT OF AGRICULTURE

at the

Twenty - Fifth

International Live Stock Exposition

Chicago, Illinois,

November 29 to December 6,

1924.



Data Provided Through Courtesy of University of Illinois.

UNITED STATES DEPARTMENT OF AGRICULTURE
LIVESTOCK EXHIBIT

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A POUND OF PORK EVERY SEVEN MINUTES

OR

THE STORY OF A WELL-ORGANIZED HOG FARM

This is not a phenomenal hog farm. Surely there are others as good, and there may be many which are better. This story tells how a farmer in Woodford County, Illinois, raises hogs successfully. If the soil is more fertile than the soil of other farms in that section it is because of the soil-improvement policy of its operator. The farm equipment is neither elaborate nor expensive and the owner has in mind many improvements which may come with the dawn of a more prosperous day. A large volume of business is done on this 160-acre farm, considering that the owner does all the work with the help of a hired man during the summer.

This farm is planned to follow a definite system of hog production with as little unnecessary work as possible. The following diagram shows that the farm is divided by straight-line fences into six fields.

Field 1	Farm- stead
	Minor Rotation
Field 2	Field 5
Field 3	Field 4

One of these fields is sub-divided into the farmstead with its buildings and lots and several small fields which make up the "minor rotation". This "minor rotation" plays a large part in the success of the hog business on this farm. The five large fields in the farm make up the "major rotation" of the cropping system, providing for a five-year rotation of crops. The accompanying plan of this rotation shows what crops have been or will be in each field for a five-year period.

CROPS GROWN IN THE MAJOR ROTATION

Field No.	1922	1923	1924	1925	1926
1	Oats	Pasture	Corn	Early corn Soybeans	Corn
2	Corn	Corn Soybeans	Corn	Oats	Pasture
3	Pasture	Corn	Sweet Corn Soybeans	Corn	Oats
4	Corn	Oats	Pasture	Corn	Early corn Soybeans
5	Early corn Soybeans	Corn	Oats	Pasture	Corn

The rotation consists principally of three years of corn followed by oats and then clover. The three successive years of corn are modified slightly in the second year by growing soybeans and some other crop (usually an early variety of corn or sweet corn for the local canning factory). The second year is the proper place to insert the soybeans in the rotation as the fertility which they add to the soil will be beneficial to the corn the following year. The systematic use of clovers in the rotation, the plowing under of some growth for its value as green manure, and the grazing of livestock in all the fields, contribute to the building up of soil fertility, and prevent the drain on the soil of three successive years of corn. Three years of successive corn is not a long time practice on this farm as this farmer has built up his fertility in the past and is now "cashing in" on this fertility by growing a little more than two years of corn continuously.

THE MINOR ROTATION.

A "minor rotation" is a series of crops in relatively small fields near the farmstead which are planned to aid in the production of livestock. Such a rotation is more generally used in the production of hogs than any other kind of livestock. Since forage crops have become quite popular in hog production, a minor rotation permits growing these pastures and other crops near the farmstead and provides several fields for the use of different bunches of hogs when the hogs are sorted. Under this system clean pasture is available each year. This is important as worms and disease are more readily controlled if clean pastures instead of the cramped feed lots are used. The owner of this farm attributes much of his success as a pork producer to the value of clean pasture for keeping his hogs in a thrifty condition.

A minor rotation on any farm may be adapted to different methods of raising hogs. If only a few hogs are raised, a three-year rotation of corn, oats, and clover might be sufficient. The clover pasture may be divided by temporary fences when the hogs are sorted. If a large number of hogs are produced more fields will simplify their management. Five fields are used in the minor rotation on this farm. Four of these fields are used for the minor rotation proper, consisting of corn, corn, oats and clover. The fifth field is divided to grow alfalfa and a small quantity of rye. Every fourth year a new field is seeded to alfalfa and rye and the old field of alfalfa and rye takes its place in the minor rotation. The crops which have been or will be planted in each field in this minor rotation for a five-year period are given in the following schedule.

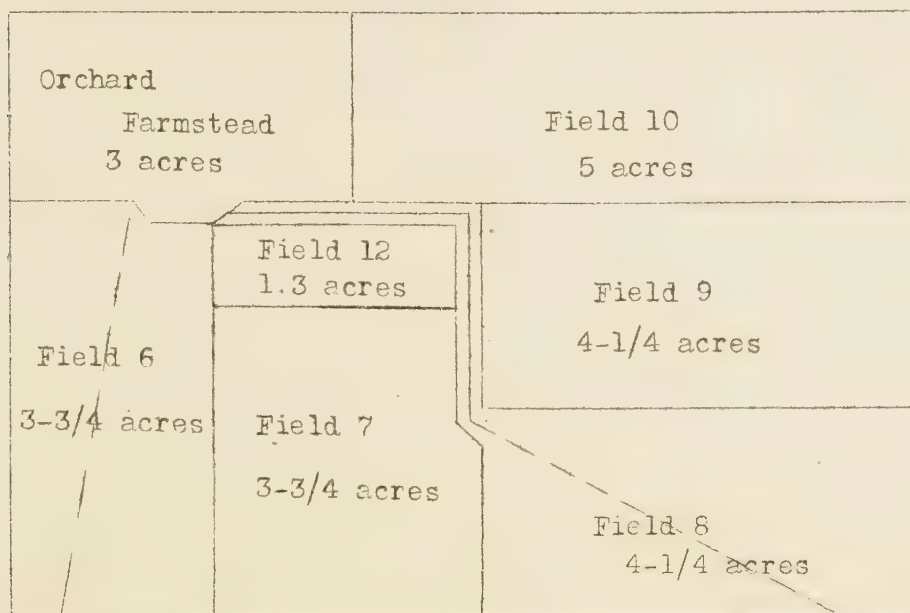
CROPS USED IN MINOR ROTATION.

Field No.	1922	1923	1924	1925	1926
6	Oats	Pasture	Corn	Oats	Pasture
7	Oats*	Alfalfa	Alfalfa	Alfalfa	Alfalfa
8	Corn	Oats	Pasture	Corn	Oats
9	Alfalfa	Corn	Oats	Pasture	Corn
10	Pasture	Corn	Corn	Corn	Oats*
11	Rye	Rye	Rye	Rye	Rye

*Oats seeded to alfalfa.

The use of so many different fields in the raising of hogs may increase the amount of labor required to care for them unless the minor rotation is carefully planned to make the chores as easy as possible. Access to water fountains from any of the fields should be provided by the use of temporary

or permanent lanes or by piping the water to each field. If self-feeders are used the hog chores are very light. The farmer in this story reduced his chores on hogs to a minimum by using self-feeders, hog waterers, and lanes from the pastures to the water. The following diagram of the minor rotation and lots shows the convenient arrangement of this farm.



Hogs may be shifted from one field to another through convenient gates. The temporary division fence in the clover pasture to accommodate two bunches of pigs and the double lane leading to the water and shelter is shown in the diagram for two years. The pigs were in Field 6 in 1923 and were in Field 8 in 1924.

THE PRODUCTION OF CROPS AND LIVESTOCK.

The crops grown on this farm are intended for the production of pork. Varying amounts of surplus crops may be sold from year to year as crop yields affect the balance between crops and livestock. The following table gives the acreage and yields of the crops grown on this farm for the crop year 1923.

CROPS GROWN ON FARM - Year 1923.

Crops	Major Rotation			Minor Rotation			Total
	Acres	Yield	Bushels	Acres	Yield	Bushels	Produced
Corn	69 $\frac{3}{4}$	55.8	3890	9 $\frac{1}{4}$	62.7	580	4470 Bushels
Oats	27	60.0	1620	4 $\frac{1}{4}$	62.3	265	1885 "
Soybeans	9 $\frac{1}{4}$	Fed in sheaf					200 tons
Alfalfa				3 $\frac{1}{4}$	3.0	10	10 "
Clo. Pasture	26			3 $\frac{1}{4}$			
Rye "				1			
Farmstead				7			

Soybeans were also planted with the corn. The yield of these beans was estimated at five bushels per acre. The total production of soybeans was probably in excess of 600 bushels. The hogs cleaned up the beans in the corn and the beans which were harvested were fed in the sheaf to the hogs and other livestock. Surplus supplies of oats and alfalfa hay were sold. The larger yields made in the minor rotation are probably due to higher fertility resulting from more intensive grazing by the hogs.

The amount of pork produced on this farm is shown by the following table giving in detail the production and disposal of each class of hogs.

SUMMARY OF PORK PRODUCED - YEAR 1923.

Class of hogs	Opening inv. No.	Opening inv. Weight	Purchases No.	Purchases Weight	Weaned No.	Sales No.	Sales Weight	Closing Inv. No.	Closing Inv. Weight	Died No.
Boars	2	600	1	200		1	470	2	700	
Old sows	11	3,300				12	3,385	20	6,000	
Gilts	21	4,200						15	3,000	
						82	23,630			4
Sp. pigs	86	17,000			235	64	11,530	151	30,265	5
Fall pigs	95	6,650			110	92	23,970	110	7,700	3
Total	215	31,750	1	200	345	251	62,985	298	47,665	12

Opening Inventory	215 Hogs	- 31,750 lbs.	Closing Inventory	298 Hogs	- 47,665 lbs.
Purchase	1 "	- 200 "	Sales	251 "	- 62,985 "
Weaned	345 "	- -	Dead	12 "	- -
Total	561 "	31,950 lbs.	Total	561 "	110,650 "

MARKETABLE PORK PRODUCED - 78,700 pounds

The increase in live weight during the year was 78,700 pounds when estimated weights are used in the opening and closing inventories. Twelve pigs of various weights died during the year. The weight of these dead pigs is not included in the total pounds of pork produced.

This farmer produced a pound of pork every seven minutes, day and night for 365 days. The details of how he handled the hogs to do this is told by following each bunch of hogs in their journey from field to feedlot to market.

HOW THE 86 SPRING HOGS WERE FATTENED.

These 86 spring hogs which were on the farm at the beginning of the year were housed in a small shed and had the run of a concrete paved lot where they were fed ear corn and whole oats. On March 7, eighty-two of these hogs averaging 288 pounds were sold for an average price of \$7.52 per 100 pounds. These hogs gained 1.34 pounds per day during this period.

HOW THE 95 FALL PIGS WERE FATTENED.

During the winter the 95 fall pigs occupied the small shed on the south side of the horse barn. They were fed a ration of ear corn with whole oats and a commercial mixed-protein feed in self-feeders. They cleaned up the soybeans in the cornfield and some soybeans in the sheaf were also fed them.

On April 1, these fall pigs were turned on five acres of clover pasture in Field 2. This field was pastured during the previous year and all but the five acres had been fall-plowed for corn. This pasture provided abundant grazing. The pigs were hand-fed ear corn and oats while on pasture. This pasture was plowed up for corn on May 1 and the pigs were transferred to Field 1 where they ran on a clover-mixture pasture with the horses and cattle. The pigs were fed during the summer on a ration of two-thirds corn and one-third oats. A mineral mixture of salt, ground raw rock phosphate, and agricultural limestone was before the pigs at all times.

On the twenty-eighth of May, 20 of the heaviest of the pigs averaging 260 pounds were sold for \$7.21 per 100 pounds. The remaining 72 pigs averaging 261 pounds were sold August 22, for \$8.20 per 100 pounds. The average daily gain of these pigs from January 1 to date of sale was 0.89 pound per pig. This daily gain undoubtedly would have been increased by a full feed of corn and a protein supplement. But it was this farmer's plan to sell these pigs in August, which he regarded as the most favorable month for marketing and he fed a ration which would have them ready for market at that time. A richer ration and a greater daily gain would have finished the pigs before the desired time.

THE CARE OF THE BREEDING HERD.

During the winter the breeding herd was housed in a portion of the small shed on the south side of the horse barn and had the run of small fields and a concrete lot for feeding. Ear corn and soybeans in the sheaf were fed during the first two months of the gestation period. This ration was changed to two-thirds corn, one-third oats, and tankage during the last half of the gestation period. Linseed meal was fed just previous to farrowing as a conditioner. The corn was fed in the evening and the oats in the morning to induce greater activity during the day.

Special attention was given the sows at farrowing time. They were given no feed for 24 hours after farrowing. Beginning with an ear of corn and some oats the second day, the ration was increased one ear of corn per day for five days and thereafter according to the condition of the sow and the size of the litter. Corn, oats, and a little tankage constituted the ration for the first three weeks following farrowing. The sows and litters were moved to the pasture as soon as the spring weather would permit. The sows were on almost a full feed of corn, oats, and some tankage until the pigs were weaned. By constructing creeps the pigs were fed shell corn, middlings, and tankage before weaning.

The spring pigs were farrowed during March and April in the central hog house, five individual A-type houses, and several pens arranged in the horse barn. The sows were cleaned by brushing, and plenty of bedding was kept in the farrowing pens. Thirty-two sows were bred for spring farrowing and there were no abortions or barren sows. These sows weaned 235 spring pigs or an average of 7.34 pigs per sow. The farrowing quarters were adjusted so that the sows could go into the lot for exercise and the pigs leave by a creep to exercise in the feedway of the hog house.

THE BROOD SOWS DURING THE SUMMER.

After the spring pigs were weaned the brood sows were placed in the small rye field and later in the alfalfa pasture. Twenty sows were bred for fall farrowing and the other twelve were fattened and sold on September 12. The brood sows were fed almost entirely on corn and alfalfa pasture. A very limited amount of oats and tankage was fed to them during the summer. The fall pigs were farrowed during August and were weaned about October 20. Twenty sows weaned 110 fall pigs or an average of 5.5 pigs per sow.

FATTENING THE SPRING PIG CROP.

The farmer in this story manages his spring pig crop so that the heavy end reaches the early fall market and the light end the late winter market.

The field of clover pasture in the minor rotation was divided by a temporary fence to accommodate the early and late pigs. The early pigs were grown as rapidly as possible on a self-fed ration of corn, tankage, and middlings. On September 12, the 64 early pigs were sold averaging 180 pounds each, for \$8.20 per 100 pounds.

The late pigs were hand-fed a ration of corn, oats, and tankage on clover pasture until August 1. They were then turned into the stubble clover in Field 4. The limited ration of corn, oats, and a little tankage was continued until November 10, when they were turned into the corn stalk field to clean up the soybeans and corn left from husking. Besides the 15 gilts which had been selected for the breeding herd, there were 151 of these late spring pigs on the farm on the date of the second inventory, January 1, 1924. They are ready to go into the feedlot to be fattened and sold some time in March, as has been described earlier in the story for the previous crop of pigs.

WEANING THE FALL PIGS.

The fall pigs were weaned on a self-fed ration of shell corn, oats, and a 50-50 mixture of tankage and Red Dog flour. During the fall months they grazed on alfalfa and rye pastures. There were 110 of these fall pigs on the farm on the date of the second inventory averaging about 70 pounds. They will be carried through the winter and fattened during the summer much the same as has been described for the previous crop of fall pigs.

FEEDS CONSUMED ON THE FARM

The amount of feed consumed by the livestock on this farm is shown in the following table which brings together the feeds produced, sold, purchased, and carried over in the inventories from year to year. The balance is the feed consumed by the livestock.

QUANTITIES OF FEED CONSUMED BY LIVESTOCK

	: Corn	: Oats	: Hay	: Soybeans	: Purchased commercial feed
	:(Bushels)	:(Bushels)	:(Tons)		:(Dollars)
Opening Inventory	: 4,000	: 1,500	: 18	:	:
Produced	: 4,470	: 1,885	: 10	: Sheaf	:
Purchased	: 570	: -	: -	:	: 739.53
Total	: 9,040	: 3,385	: 28	:	: 739.53
Closing Inventory	: 3,000	: 1,200	: 17	: Some	: 52.00
Sold	: -	: 785	: 2	:	:
Fed on Farm	: 6,040	: 1,400	: 9	:	: 687.53
Hogs	: 5,540	: 1,250	: -	:	:
Other Stock	: 500	: 150	: 9	:	:

The following table shows the quantities of feed which have been charged to the hogs on this farm and the amounts of each feed per 100 pounds of pork produced.

QUANTITIES OF FEED CONSUMED BY HOGS (78,700 pounds Pork)

Feeds	: Total	: Per 100 lbs.
Corn	: 5,540 bus.	: 7.04 bus.
Oats	: 1,250 bus.	: 1.58 "
Tankage	: 8,500 lbs.	: 10.80 lbs.
Middlings	: 4,200 lbs.	: 5.34 "
Commercial mixed feed	: 6,000 lbs.	: 7.62 "
Linseed meal	: 100 lbs.	:

These quantities of feed per 100 pounds of pork compare very favorably with other data secured by the United States Department of Agriculture on the amounts of feeds required to produce 100 pounds of pork.

SUMMARY OF PASTURES AND RATIONS

A clover mixture of alsike, red, and sweet clover and timothy is sown in all oat fields to provide plenty of pasture for the hogs and build up the soil fertility. That the abundant forage provided by sweet clover increases the carrying capacity of the pasture is the opinion of this farmer. The time which the various bunches of hogs were grazing on the different pastures during 1923 is as follows:

Breeding Herd.

April 1 to May 1 - Clover mixture, Field 1.
May 1 to June 15 - Rye, Field 11.
June 15 to Aug. 1 - Alfalfa, Field 7.
Aug. 1 to Nov. 5 - Stubble clover, Field 8.

Early Spring Pigs.

May 1 to Sept. 10 - Clover mixture, Field 6.

Late Spring Pigs.

May 1 to Aug. 1 - Clover mixture, Field 6.
Aug. 1 to Nov. 10 - Stubble clover, Field 4.
Nov. 10 to Jan. 1 - Soybeans in corn fields.

Fall Pigs (On Farm January 1, 1923)

March 15 to April 1 - Rye, Field 11.
April 1 to May 1 - Clover mixture, Field 2.
May 1 to Aug. 20 - Clover mixture, Field 1.

Farrowed During August 1923.

October 20 to Dec. 1 - Alfalfa, Field 7.
Dec. 1 - Rye, Field 11.

The variety of feeds in the ration used on this farm is seen from the following summary:

Breeding Herd.

Gestation period:-

First two months - corn and soybeans.
Last two months - corn $\frac{2}{3}$, oats $\frac{1}{3}$, tankage, linseed meal.

Suckling period:-

Corn, oats, tankage, almost full feed.

SPRING PIGS

Early spring litters - corn, tankage, middlings in self-feeders.

Late spring litters - corn, oats, tankage, and soybeans in corn fields.

FALL PIGS

Weaning Ration - corn, oats, tankage $\frac{1}{2}$ and Red Dog Flour in self-feeders.

Winter Ration - corn, oats, mixed protein feed, soybeans in corn fields.

Summer Ration - corn, oats.

THE EARNING POWER OF THIS HOG FARM.

This farm was successful in producing a large amount of pork. If the farm expenses were reasonable and the price of pork fairly satisfactory, the farm should show a fair farm income. The summary of the business on this farm for the year 1923 is as follows:

Farm Receipts

Livestock.

Net increase hogs.....	\$5,777.18
Poultry	122.52
Cattle	56.23

Crops.

Oats	368.76
Hay	33.90
Miscellaneous crop	45.00

Total receipts \$ 6,491.09

Farm Expenses

Decrease, feed and supplies	\$ 500.49
Purchased feed	547.00
Depreciation of farm improvements	253.00
" on farm machinery	204.00
" on work horses	10.00

Cash Farm Expenses:

Livestock expense	\$126.23
Misc. Crop expense	141.85
Hired labor	355.47
Taxes	425.96
Insurance	12.00
Miscellaneous	42.00
	<u>1104.00</u>

Total Farm Expense \$ 2,618.00

Net Farm Income \$ 3,873.09

When the cash farm expenses and the net decreases in the inventories of feed, buildings, and machinery are deducted from the farm receipts a farm income of \$3,874 remains. The farm income is the amount which the farm returned to the operator for his labor and the use of capital invested. If the operator's labor be valued at \$600 per year in addition to part of the family living secured from the farm, there remains \$3,274 as return on investment. The total investment on this farm for the year 1923 was \$62,317 of which \$50,000 was the owner's appraisal of the 160 acres of land and \$12,317 for investment in livestock, machinery, feed and supplies, and farm buildings exclusive of the dwelling. The return to capital of \$3,274 was at the rate of 5-1/4 per cent on an investment of \$62,317. The rate of return to capital depends largely on the value of the land which in this case was \$312.50 per acre. If the inventory value of the land were written down so that the total investment were \$55,000 the rate of return would be 5.95 per cent; if the total investment were \$50,000 the rate of return would be 6.55 per cent; and if the investment be reduced as low as \$45,000 or about \$200

per acre for the land the rate of return would be 7.27 per cent. When the net farm income of \$3,874 is placed on an acre basis, there is \$24.21 per acre as return for the operator's labor and capital investment.

From this analysis of the farm business, it is seen that the volume of pork which this farmer produced yielded a fair return. If hogs had been in a more favorable position on the market the return would have been more satisfactory.

RETURNS BY LIVESTOCK FOR FEED CONSUMED.

The returns which livestock make for the feed they consume is determined by the values of feed and livestock as well as efficient production. The average sale price of pork on this farm for 1923 was \$7.77 per 100 pounds. Feed was bought or sold on this farm for the following prices: Corn 70 cents, oats 47 cents per bushel, and hay \$17 per ton. If these prices are used for the feed consumed by the livestock, the livestock returned \$104 for each \$100 worth of feed they consumed. In other words, the livestock, principally hogs, returned slightly more than market price for their feed. The following table gives the amount which the livestock would have returned with varying values for feeds and pork.

AMOUNT WHICH LIVESTOCK RETURNED FOR \$100 WORTH OF FEED WHEN

PORK IS	:	AND FEEDS ARE VALUED AT								
VALUED AT	:	Corn	.70	1/	Corn	1.00	Corn	.75	Corn	.50
	:	Oats	.47	:	Oats	.40	Oats	.35	Oats	.30
	:	Hay	17.00	:	Hay	20.00	Hay	15.00	Hay	10.00
\$ 7.77 per 100 lbs.*	:	\$104	:	\$ 80	:	\$ 102	:	\$ 141	:	
\$ 6.00 per 100 lbs.	:	84	:	65	:	83	:	114	:	
\$ 8.00 per 100 lbs.	:	106	:	82	:	104	:	144	:	
\$10.00 per 100 lbs.	:	128	:	98	:	126	:	174	:	
\$12.00 per 100 lbs.	:	150	:	115	:	147	:	204	:	

*Actual values on this farm during 1923.

The story of how this farmer raises hogs is told. He was successful in handling the breeding herd and raised a large number of pigs per sow. These pigs were well cared for and made good gain on farm grown feeds and some protein supplements. The pigs were grown so as to be marketed at the right time. Since the relation of corn price to hog price was unfavorable to hogs the farm income and the interest earned on the capital invested does not show up as large as one would expect from the business done. But this is due to a market condition and not to the organization of the farm for economical pork production.

Three factors of success in hog production:

1. Convenient arrangement of quarters.
2. Good clean pastures.
3. Wholesome rations.



